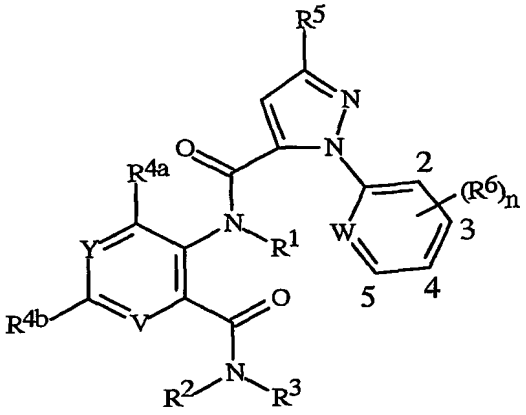
CLAIMS

What is claimed is:

1. A compound of Formula I, its *N*-oxide or an agronomic or nonagronomic suitable salt thereof



I

wherein:

Y and V are each independently N or CR^{4a};

W is N, CH or CR^6;

R^1 is H; or C_1-C_6 alkyl, C_2-C_6 alkenyl, C_2-C_6 alkynyl or C_3-C_6 cycloalkyl, each optionally substituted with 1 to 5 substituents independently selected from the group consisting of halogen, CN, NO_2, hydroxy, C_1-C_4 alkoxy, C_1-C_4 alkylthio, C_1-C_4 alkylsulfinyl, C_1-C_4 alkylsulfonyl, C_2-C_4 alkoxycarbonyl, C_1-C_4 alkylamino, C_2-C_8 dialkylamino and C_3-C_6 cycloalkylamino; or

R^1 is C_2-C_6 alkylcarbonyl, C_2-C_6 alkoxycarbonyl, C_2-C_6 alkylaminocarbonyl or C_3-C_8 dialkylaminocarbonyl;

R^2 is H, C_1-C_6 alkyl, C_2-C_6 alkenyl, C_2-C_6 alkynyl, C_3-C_6 cycloalkyl, C_1-C_4 alkoxy, C_1-C_4 alkylamino, C_2-C_8 dialkylamino, C_3-C_6 cycloalkylamino, C_2-C_6 alkoxycarbonyl or C_2-C_6 alkylcarbonyl;

R^3 is H; G; C_1-C_6 alkyl, C_2-C_6 alkenyl, C_2-C_6 alkynyl or C_3-C_6 cycloalkyl, each optionally substituted with 1 to 5 substituents independently selected from the group consisting of halogen, G, CN, NO_2, hydroxy, C_1-C_4 alkoxy, C_1-C_4 haloalkoxy, C_1-C_4 alkylthio, C_1-C_4 alkylsulfinyl, C_1-C_4 alkylsulfonyl, C_2-C_6 alkoxycarbonyl, C_2-C_6 alkylcarbonyl, C_3-C_6 trialkylsilyl, phenyl, phenoxy and 5- or 6-membered heteroaromatic ring, each phenyl, phenoxy and 5- or 6-membered heteroaromatic ring optionally substituted with 1 to 3 substituents independently selected from R^{14}; C_1-C_4 alkoxy; C_1-C_4 alkylamino; C_2-C_8 dialkylamino; C_3-C_6 cycloalkylamino; C_2-C_6 alkoxycarbonyl; C_2-C_6

alkylcarbonyl; or phenyl optionally substituted with 1 to 3 substituents independently selected from R^{14}; or

R^2 and R^3 are taken together with the nitrogen to which they are attached to form a ring containing 2 to 6 atoms of carbon and optionally one additional atom of nitrogen, sulfur and oxygen, said ring optionally substituted with 1 to 4 substituents independently selected from the group consisting of C_1-C_2 alkyl, halogen, CN, NO_2 and C_1-C_2 alkoxy;

G is a 5- or 6-membered nonaromatic carbocyclic or heterocyclic ring, optionally including one or two ring members independently selected from the group consisting of C(=O), S(O) or $S(O)_2$ and optionally substituted with 1 to 4 substituents independently selected from the group consisting of C_1-C_2 alkyl, halogen, CN, NO_2 and C_1-C_2 alkoxy;

R^{4a} and R^{4b} are each independently H, C_1-C_6 alkyl, C_2-C_6 alkenyl, C_2-C_6 alkynyl, C_3-C_6 cycloalkyl, C_1-C_6 haloalkyl, C_2-C_6 haloalkenyl, C_2-C_6 haloalkynyl, C_3-C_6 halocycloalkyl, halogen, CN, SCN, NO_2, hydroxy, C_1-C_4 alkoxy, C_1-C_4 haloalkoxy, C_1-C_4 alkylthio, C_1-C_4 alkylsulfinyl, C_1-C_4 alkylsulfonyl, C_1-C_4 alkylsulfonyloxy, C_1-C_4 haloalkylthio, C_1-C_4 haloalkylsulfinyl, C_1-C_4 haloalkylsulfonyl, C_1-C_4 haloalkylsulfonyloxy, C_1-C_4 alkylamino, C_2-C_8 dialkylamino, C_3-C_6 cycloalkylamino, C_2-C_6 alkylcarbonyl, C_2-C_6 alkoxycarbonyl, C_2-C_6 alkylaminocarbonyl, C_3-C_8 dialkylaminocarbonyl or C_3-C_6 trialkylsilyl; or

R^{4a} and R^{4b} are each independently phenyl, benzyl or phenoxy, each optionally substituted with 1 to 3 substituents independently selected from R^{14};

R^5 is C_1-C_6 alkyl, C_2-C_6 alkenyl, C_2-C_6 alkynyl, C_3-C_6 cycloalkyl, C_4-C_7 alkylcycloalkyl, C_1-C_6 haloalkyl, C_2-C_6 haloalkenyl, C_2-C_6 haloalkynyl, C_3-C_6 halocycloalkyl, C_4-C_7 haloalkylcycloalkyl, each substituted with 1 to 2 substituents independently selected from R^{11}; or

R^5 is OR^7, $S(O)_pR^7$, NR^8R^9, $OS(O)_2R^{10}$, $NR^9S(O)_2R^{10}$, $C(S)NH_2$, $C(R^{13})=NOR^{13}$, C_4-C_7 halocycloalkylalkyl, C_1-C_4 alkylaminothiocarbonyl or C_1-C_4 dialkylaminothiocarbonyl;

each R^6 is independently C_1-C_6 alkyl, C_2-C_6 alkenyl, C_2-C_6 alkynyl, C_3-C_6 cycloalkyl, C_1-C_6 haloalkyl, C_2-C_6 haloalkenyl, C_2-C_6 haloalkynyl, C_3-C_6 halocycloalkyl, halogen, CN, CO_2H, $C(O)NH_2$, NO_2, hydroxy, C_1-C_4 alkoxy, C_1-C_4 haloalkoxy, C_1-C_4 alkylthio, C_1-C_4 alkylsulfinyl, C_1-C_4 alkylsulfonyl, C_1-C_4 haloalkylthio, C_1-C_4 haloalkylsulfinyl, C_1-C_4 haloalkylsulfonyl, C_1-C_4 alkylamino, C_2-C_8 dialkylamino, C_3-C_6 cycloalkylamino, C_2-C_6 alkylcarbonyl, C_2-C_6 alkoxycarbonyl, C_2-C_6 alkylaminocarbonyl, C_3-C_8 dialkylaminocarbonyl, C_3-C_6 trialkylsilyl; or

each R^6 is independently a phenyl, benzyl, benzoyl, phenoxy, 5- or 6-membered heteroaromatic ring or an aromatic 8-, 9- or 10-membered fused heterobicyclic ring system, each ring optionally substituted with 1 to 3 substituents independently selected from R^{14};

each R^7 is independently C_1-C_6 alkyl substituted with R^{12}; C_2-C_6 alkenyl, C_2-C_6 alkynyl, C_3-C_6 cycloalkyl, C_4-C_7 cycloalkylalkyl, C_4-C_7 alkylcycloalkyl, C_2-C_6 haloalkenyl, C_2-C_6 haloalkynyl, C_3-C_6 halocycloalkyl, C_4-C_7 haloalkylcycloalkyl, C_4-C_7 halocycloalkylalkyl or C_2-C_6 haloalkylcarbonyl, each optionally substituted with one R^{12};

R^8 is C_1-C_6 alkyl, C_2-C_6 alkenyl, C_2-C_6 alkynyl, C_3-C_6 cycloalkyl, C_4-C_7 alkylcycloalkyl, C_1-C_6 haloalkyl, C_2-C_6 haloalkenyl, C_2-C_6 haloalkynyl, C_3-C_6 halocycloalkyl, C_4-C_7 haloalkylcycloalkyl or C_2-C_6 haloalkylcarbonyl, each substituted with one R^{12};

R^9 is H; or C_1-C_6 alkyl, C_2-C_6 alkenyl, C_2-C_6 alkynyl, C_3-C_6 cycloalkyl, C_4-C_7 alkylcycloalkyl, C_1-C_6 haloalkyl, C_2-C_6 haloalkenyl, C_2-C_6 haloalkynyl, C_3-C_6 halocycloalkyl or C_4-C_7 haloalkylcycloalkyl, each optionally substituted with one R^{12};

R^{10} is C_1-C_6 alkyl, C_2-C_6 alkenyl, C_2-C_6 alkynyl, C_3-C_6 cycloalkyl, C_4-C_7 alkylcycloalkyl, C_1-C_6 haloalkyl, C_2-C_6 haloalkenyl, C_2-C_6 haloalkynyl, C_3-C_6 halocycloalkyl or C_4-C_7 haloalkylcycloalkyl, each optionally substituted with one R^{12};

each R^{11} is independently C_1-C_6 alkoxy, C_1-C_6 haloalkoxy, C_1-C_6 alkylthio, C_1-C_6 haloalkylthio, C_1-C_6 alkylsulfinyl, C_1-C_6 haloalkylsulfinyl, C_1-C_6 alkylsulfonyl, C_1-C_6 haloalkylsulfonyl, CN or C_2-C_4 alkoxycarbonyl;

each R^{12} is independently C_1-C_6 alkoxy, C_1-C_6 haloalkoxy, C_1-C_6 alkylthio, C_1-C_6 haloalkylthio, C_1-C_6 alkylsulfinyl, C_1-C_6 haloalkylsulfinyl, C_1-C_6 alkylsulfonyl, C_1-C_6 haloalkylsulfonyl, CN, NO_2, C_2-C_4 alkoxycarbonyl, C_1-C_6 alkylamino or C_2-C_6 dialkylamino; or

each R^{12} is independently a phenyl or a 5- or 6-membered heteroaromatic ring, each ring optionally substituted with 1 to 3 substituents independently selected from R^{14};

each R^{13} is independently H, C_1-C_4 alkyl, or C_1-C_4 haloalkyl;

each R^{14} is independently C_1-C_4 alkyl, C_2-C_4 alkenyl, C_2-C_4 alkynyl, C_3-C_6 cycloalkyl, C_1-C_4 haloalkyl, C_2-C_4 haloalkenyl, C_2-C_4 haloalkynyl, C_3-C_6 halocycloalkyl, halogen, CN, NO_2, C_1-C_4 alkoxy, C_1-C_4 haloalkoxy, C_1-C_4 alkylthio, C_1-C_4 alkylsulfinyl, C_1-C_4 alkylsulfonyl, C_1-C_4 alkylamino, C_2-C_8 dialkylamino, C_3-C_6 cycloalkylamino, C_3-C_6 (alkyl)cycloalkylamino, C_2-C_4

alkylcarbonyl, C_2-C_6 alkoxycarbonyl, C_2-C_6 alkylaminocarbonyl, C_3-C_8 dialkylaminocarbonyl or C_3-C_6 trialkylsilyl;

n is 0, 1, 2, 3 or 4; and

p is 0, 1 or 2.

2. The compound of Claim 1 wherein

R^1 is H, C_1-C_4 alkyl, C_2-C_4 alkenyl, C_2-C_4 alkynyl, C_3-C_6 cycloalkyl, C_2-C_6 alkylcarbonyl or C_2-C_6 alkoxycarbonyl;

R^2 is H, C_1-C_4 alkyl, C_2-C_4 alkenyl, C_2-C_4 alkynyl, C_3-C_6 cycloalkyl, C_2-C_6 alkylcarbonyl or C_2-C_6 alkoxycarbonyl;

R^3 is C_1-C_6 alkyl, C_2-C_6 alkenyl, C_2-C_6 alkynyl or C_3-C_6 cycloalkyl each optionally substituted with 1 to 5 substituents independently selected from the group consisting of halogen, CN, C_1-C_2 alkoxy, C_1-C_2 alkylthio, C_1-C_2 alkylsulfinyl and C_1-C_2 alkylsulfonyl;

R^{4a} and R^{4b} are each independently H, C_1-C_4 alkyl, C_1-C_4 haloalkyl, halogen, CN, NO_2, C_1-C_4 alkoxy, C_1-C_4 haloalkoxy, C_1-C_4 alkylthio, C_1-C_4 alkylsulfinyl, C_1-C_4 alkylsulfonyl, C_1-C_4 haloalkylthio, C_1-C_4 haloalkylsulfinyl or C_1-C_4 haloalkylsulfonyl;

each R^6 is independently C_1-C_4 alkyl, C_1-C_4 haloalkyl, halogen, CN, NO_2, C_1-C_4 alkoxy, C_1-C_4 haloalkoxy, C_1-C_4 alkylthio, C_1-C_4 alkylsulfinyl, C_1-C_4 alkylsulfonyl, C_1-C_4 haloalkylthio, C_1-C_4 haloalkylsulfinyl, C_1-C_4 haloalkylsulfonyl or C_2-C_4 alkoxycarbonyl; and

n is 0, 1 or 2.

3. The compound of Claim 2 wherein:

Y and V are each independently N or CH;

W is N, CH, CF, CCl, CBr or CI;

R^1 is H;

R^2 is H or CH_3;

R^3 is C_1-C_4 alkyl optionally substituted with 1 to 5 substituents independently selected from the group consisting of halogen, CN, OCH_3 and $S(O)_pCH_3$;

R^{4a} and R^{4b} are each independently H, CH_3, CF_3, OCF_3, $OCHF_2$, $S(O)_pCF_3$, $S(O)_pCHF_2$, CN or halogen;

each R^6 is independently halogen, CN, CH_3, CF_3, $OCHF_2$, $S(O)_pCF_3$, $S(O)_pCHF_2$, OCH_2CF_3, OCF_2CHF_2, $S(O)_pCH_2CF_3$ or $S(O)_pCF_2CHF_2$; and

n is 0 or 1.

4. The compounds of Claim 3 wherein

W is N; and

R^{4a} and R^{4b} are each independently H, CH_3, CF_3, CN or halogen.

5. The compound of Claim 4 wherein

R^3 is C_1-C_4 alkyl;

R^{4a} is H, CH_3, Cl, Br or I;

R^{4b} is H, F, Cl, Br, I, CN or CF_3;

R^5 is $OS(O)_2CH_3$, $OS(O)_2CF_3$, $CF_2O(C_1$-C_4 alkyl), $CF_2S(C_1$-C_4 alkyl) or C_3-C_4 haloalkenyloxy; and

R^6 is CH_3, CF_3, OCH_2CF_3, $OCHF_2$ or halogen at position 2.

6. The compounds of Claim 4 wherein

R^3 is C_1-C_4 alkyl;

R^{4a} is H, CH_3, Cl, Br or I;

R^{4b} is H, F, Cl, Br, I, CN or CF_3; and

R^5 is C_2-C_6 alkenyloxy, C_2-C_6 alkynyloxy, C_1-C_6 alkoxy substituted with CN or C_1-C_2 alkoxy.

7. The compounds of Claim 4 wherein

R^3 is C_1-C_4 alkyl;

R^{4a} is H, CH_3, Cl, Br or I;

R^{4b} is H, F, Cl, Br, I, CN or CF_3; and

R^5 is $C(R^{13})$=NOR^{13}.

8. A composition of controlling an invertebrate pest comprising biologically effective amount of a compound of Claim 1 and at least one additional component selected from the group consisting of a surfactant, a solid diluent, and a liquid diluent, said composition optionally further comprising an effective amount of at least one additional biologically active compound or agent.

9. The composition of Claim 8 wherein the additional biologically active compound or agent is present and is selected from the group consisting of cypermethrin, cyhalothrin, cyfluthrin, beta-cyfluthrin, esfenvalerate, fenvalerate, tralomethrin, fenothicarb, methomyl, oxamyl, thiodicarb, clothianidin, imidacloprid, thiacloprid, indoxacarb, spinosad, abamectin, avermectin, emamectin, γ-aminobutyric acid, endosulfan, ethiprole, fipronil, flufenoxuron, triflumuron, diofenolan, pyriproxyfen, pymetrozine, amitraz, Bcaillus thuringiensis, Bacillus thuringiensis delta endotoxin, a member of the family Baculoviridae, and entomophagous fungi.

10. A method for controlling an invertebrate pest comprising contacting the invertebrate pest or its environment with a biologically effective amount of a compound of Claim 1 or with a biologically effective amount of a composition of Claim 8.

11. The method of Claim 10 wherein the invertebrate pest is cockroach, an ant or a termite which contacts the compound by consuming a bait composition comprising the compound or the composition.

12. The method of Claim 10 wherein the invertebrate pest is a mosquito, a black fly, a stable, fly, a deer fly, a horse fly, a wasp, a yellow jacket, a hornet, a tick, a spider, an

ant, or a gnat which is contacted by a spray composition comprising the compound or the composition dispensed from a spray container.

13. A spray composition, comprising:

(a) a compound of Claim 1 or a composition of Claim 8; and

(b) a propellant.

14. A bait composition, comprising:

(a) a compound of Claim 1 or a composition of Claim 8;

(b) one or more food materials;

(c) optionally an attractant; and

(c) optionally a humectant.

15. A device for controlling an invertebrate pest, comprising:

(a) the bait composition of Claim 14; and

(b) a housing adapted to receive the bait composition, wherein the housing has at least one opening sized to permit the invertebrate pest to pass through the opening so the invertebrate pest can gain access to the bait composition from a location outside the housing, and wherein the housing is further adapted to be placed in or near a locus of potential or known activity for the invertebrate pest.